CALIFORNIA STATE BOARD OF HEALTH

MONTHLY BULLETIN

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REGULAR MEETINGS.

The meetings of the California State Board of Health are held regularly the first Saturday of each month, but the quarterly meetings required by law to be held at the Capitol of the State are ordinarily designated as January, April, July, and October.

By courtesy of the University of California the Food and Drug Laboratory and the Hygienic Laboratory are located in University buildings at Berkeley, California.

Address all communications to the

SECRETARY, Sacramento, California.

APRIL BULLETIN.

COMMENTS.

Human Disease Carriers. History is filled with evidence that at times entire communities have believed in witchcraft or ghosts, but today most of us profess not to believe in either. And history, furthermore, is filled with the records of methods of doing things which were inconceivably crude or were based upon false theories. The history of medicine is no exception. It has its crude methods and its false theories, and even its ghosts and witches. But medicine is young—modern medicine is really much younger than the oldest inhabitant. In fact, modern medicine is about the age of the average successful young business man, about thirty-five; and preventive medicine is not yet of age. The triple alliance between medicine, engineering, and social science is scarcely ten years old. It is to be expected that the application of these three sciences to the prevention or control of disease will undergo rapid and extensive changes from year to year.

Some of the public health practices that require thorough investigation and reorganization are those connected with quarantine and disinfection. The discovery of the role of the mosquito in the transmission of yellow fever and malaria, little more than ten years ago, has revolutionized the public health procedure in dealing with these diseases. The discovery of the similar role of certain persons apparently well, but carrying disease ''germs'' about in their throats or alimentary canals or other parts of the body, promises to greatly modify and otherwise to change the procedure in preventing the spread of other diseases. Diphtheria is known to be frequently spread through the agency of such human ''diphtheria'' carriers. Typhoid fever has been proved by many very striking instances to be frequently spread by human typhoid carriers. It is probable that carriers play an important part in the dissemination of scarlet fever. Epidemic spinal meningitis suggests the probability of human carriers as an important factor in its spread, and until recently the general evidence favored this method of spread for poliomyelitis (infantile paralysis). During the present month, Director Sawyer has been investigating a case of human glanders that promises to become a public health problem of this character.

Strictly scientific usage would probably not include victims of leprosy, malaria or syphilis among the human ''carriers'' of disease; but administratively, these individuals, like recognized ''carriers'' go about the community carrying with them a disease which is communicable to others. Syphilis and gonococcus infections have long been known to be dependent largely upon this type of human carrier for transmission. Leprosy, likewise, furnishes little evidence of being able to reach new victims except through the close continued association of a leper with other persons. Malaria is another disease, whose victims should be considered for administrative purposes, to be human carriers of disease.

All of us in a measure are human disease carriers. That is to say, there are living in our noses and throats, on our skins and in other parts of the body, many varieties of disease producing organisms. Most of these "germs" are not very powerful enemies, and can easily be dislodged at the outset from any point of vantage they may obtain. The organisms that cause head colds and those that cause pimples, boils and local abcesses are among these; also the organisms causing blood poisoning, but the latter seldom get past the outer defenses of the lymphatic system of the body. Among the frequent temporary "germ" residents of the body are the organisms causing pneumonia, and tuberculosis. Most organisms of these classes are opportunists, they do not find it easy to gain an entrance to the human body, but when they do and the preliminary battles go their way, they become numbered among the most dangerous enemies of mankind.

Every one understands about the schoolboy who is the carrier of head-lice. Such a boy is not ill, yet he is distinctly a carrier of a parasite which readily transfers itself to the heads of other children. Both teachers and parents understand the necessity for sending this boy home from school and preventing contact between him and others until his head has been properly treated. This is an imperfect illustration of the meaning of human disease carriers, and of the reasons for carefully examining, and of restricting the liberties of some persons who themselves are practically well.

* * * * *

The "Fever Ship." In March, 1912, Director Sawyer reported to the Board upon a remarkable recurrence of typhoid fever on a ship, which had covered a period of more than three years. Briefly stated, a series of nearly thirty persons (members of the crew of this ship at the time they were taken ill) suffering from typhoid fever had been taken from a certain ship. Several deaths had occurred, and the frequent intervals at which these men were removed so impressed the sailors that it became difficult to maintain a full crew. The ship became known as the "fever ship."

Every source of infection outside the ship was eliminated, and finally it was decided to begin with the captain and go through the entire crew in a microscopical search for a "typhoid carrier." This laborious task was rewarded by the discovery of one seaman, the winch driver—the ship was a lumber vessel engaged in coastwise trade—who was a carrier. This man was removed from the ship and placed in quarantine. Through the co-operation of the United States Public Health Service he was kept under observation and treatment in the San Francisco Marine Hospital for nearly six months—*not treatment and observation to benefit him, for he was already well physically, but treatment to render him no longer a source of danger to the public.*

At the end of this period it seemed justifiable on the basis of these observations to release him on condition that he report every two weeks. Within two months after his release three more persons developed typhoid fever on another vessel upon which he shipped as a seaman. One of this number died. Investigation showed on this ship the same conditions of a common water barrel and common cup, believed to have been the chief source of this typhoid-carrier's transfer of his disease to the first series of victims. He was again returned to quarantine and other measures which science has suggested are being tried in an effort to eradicate the typhoid bacilli from their residence in his alimentary tract. No cases of typhoid fever have originated among the crews of either vessel since his removal.

The fine quality of citizenship which has been displayed by this man throughout the past year of quarantine-imprisonment can not be too highly praised. Here is a man who five or six years ago contracted typhoid fever and paid the cost in illness and who subsequently, through no fault of his own, has become a menace to the health of the general public. Had his occupation been on land, and one which caused him to shift from town to town, it is probable he would never have been detected under the imperfect administrative health organization our cities and counties maintain. Our records would only have shown a steadily lengthening series of "sporadic" cases of typhoid fever which no one could explain. Instead of the thirty-one known cases and five deaths caused by this man we might have actually had many times this number of unknown cases due to him.

The human disease "carrier" presents many new and difficult problems to the health departments. This typhoid carrier illustrates some of these problems. Shall this man be permanently quarantined unless methods can be devised for rendering him no longer dangerous to the public health? The public demands that this be done in the control of leprosy; it hesitates to require any measures in this direction in the control of tuberculosis; it refuses thus far to seriously consider adequate measures of any kind in the control of syphilis. What will be the public verdict in cases of typhoid-carriers?

* * * * *

The Malaria Carrier. There are a few diseases in California in which a human carrier is one essential factor, but in which a second factor is equally important. Malaria is one of these. Without the human body as an incubator, or rather reservoir for the malaria parasites, this disease would become extinct, but without the assistance of a certain species of mosquito these parasites could not transfer themselves from the blood of a malaria patient to the blood of any other human being. In other words, a person suffering from malaria is in a certain sense a disease carrier; but is not dangerous to the public health unless he lives in a community where there are Anopheles mosquitoes. Obviously the first effort in controlling this disease should be to kill the mosquitoes of this species and to screen all the people from those that escape destruction. But in districts where mosquito eradication can not be carried out properly, and where a great many Anopheles mosquitoes exist, the question arises: Shall those persons having malaria (malaria carriers) be required to observe special precautions against being bitten by mosquitoes, while every effort is made to treat their illness? (This to be done not primarily on account of the patients' welfare, but in order to protect the uninfected people of the community from contracting this disease.)

Three Lepers and Our Food Supply. During the past year or so three lepers have been reported to the State Board of Health that suggest another phase of this subject of the control of human disease carriers. One of these was a groceryman doing a good business in a busy city. This groceryman was an Italian, middle aged, a man of family. He did not suspect the nature of his illness until he applied to a life insurance company for examination for insurance. This examination disclosed his condition and it was reported as required by law. The second case is also a man above forty with a wife and children. He had been a volunteer American soldier serving in the Philippines during the war with Spain. The nature of his illness was discovered through an examination for his admission to the Soldiers' Home. Prior to this discovery he had been employed in various positions, among them being the driver of a delivery wagon, which brought him in contact with many people and with food products. The third case is that of a Chinese gardener, who drove his own vegetable wagon part of the time.

Each of these unfortunate men is in a sense a leprosy carrier and went about the community carrying with him a disease which is communicable to others. Administratively he presents a problem similar to that of the typhoid-carrier or the diphtheria-carrier, *i. e.,* he is an individual who should be kept from close contact with the public for their protection rather than his own, and at least when first discovered is frequently an individual who has the promise of years before his disease seriously impairs his physical or mental activity.

Public sentiment approves the practical life imprisonment of lepers, but has thus far not been concerned with the problem of providing adequate facilities for their proper care. It is right and proper for society to protect itself from the criminal and the insane by taking away their liberty, and society is recognizing its obligation to give these individuals every needed attention and care during their periods of segregation. Similarly society will in time come to realize that the human carrier of a disease which can not be controlled in any other way than by temporary or permanent segregation, must be dealt with not only justly but generously. And society should realize another thing, *i. e.,* it will pay to invest money and time in patient investigation of new methods of control and ultimate eradication of all communicable diseases.

REPORT OF BUREAU OF ADMINISTRATION FOR MARCH, 1913.

JOHN F. LEINEN, Director.

Division of Sewage Disposal and Water Supplies.

During March a revised application for a permit for sewage disposal was received by the Board from the town of Los Gatos.

The field data relating to the Sacramento sewerage and sewage disposal problem, gathered by Mr. C. G. Gillespie, special assistant engineer under the direction of the Board's Consulting Engineer, during December, 1912, and January and February, 1913, were completely worked up and suitably arranged for a formal report on this matter. This report will be prepared as soon as certain drawings and additional data are furnished from the office of the city engineer. Mr. Gillespie prepared during the month a valuable report on the methods adopted for the field studies, many of which were extremely novel and interesting.

On March 6th and 10th the Consulting Engineer of the Board held conferences with Mr. C. E. Grunsky, consulting engineer for the city of Stockton, relative to the sewage disposal of that city.

A comprehensive report on the sewerage and sewage disposal problem of the town of Dunsmuir was submitted to the Board for action, and work was begun upon the preparation of exhaustive reports on the sewerage and sewage disposal problems of the cities of Orange and Placerville.

During March the Board's Consulting Engineer conducted considerable miscellaneous correspondence and prepared arguments to be employed at Clovis in a campaign for the voting of bonds to construct water and sewerage works and a sewage disposal plant. A special canvass was conducted by letter among complainants of nuisances alleged to have been caused by the sewage disposal area of the city of Orange.

REPORT OF BUREAU OF VITAL STATISTICS.*

GEORGE D. LESLIE, Director.

State Totals and Annual Rates.—The following table shows for California as a whole the birth, death and marriage totals for the current and preceding months in comparison with those for the corresponding months of last year, as well as the annual rates per 1,000 population represented by the totals for the current and preceding months. The rates are based on an estimated midyear population of 2,671,491 for California in 1913, the estimate having been made by the Census Bureau method with slight modifications.

Birth, Death and Marriage Totals, with Annual Rates per 1,000 Population for Current and Preceding Months for California: February.

Month.	Monthly total.		Annual rate per 1,000 population: 1913.
	1913.	1912.	
February—			
Births	3,270	3,062	16.0
Deaths	3,254	3,080	15.9
Marriages	2,040	2,184	10.0
January—			
Births	3,503	3,059	15.4
Deaths	3,827	3,216	16.9
Marriages	2,592	2,430	11.4

The birth and death totals in February were much greater this year than last year, though the marriage total was somewhat less in 1913 than in 1912.

County Totals.—The first table which follows below shows the monthly birth, death and marriage totals for the principal counties of the State, the list being limited to counties having a population of at least 25,000 according to the Federal Census of 1910. Totals are also shown for San Francisco and the other bay counties (Alameda, Contra Costa, Marin, and San Mateo), as well as for Los Angeles and Orange counties together.

City Totals.—The second of the following tables gives the birth and death totals for the principal freeholders' charter cities, the list including all chartered cities with a census population of at least 15,000 in 1910. Totals are given likewise for San Francisco in comparison with Oakland, Alameda, and Berkeley, the three cities adjoining one another on the east shore of San Francisco Bay, as well as for Los Angeles in comparison with neighboring chartered cities (Long Beach, Pasadena, Pomona, and Santa Monica).

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*NOTE.—The present report is for the month preceding, but one. This order must be followed hereafter because of the publication of the Bulletin during the early part of the month, before the tabulation of records for the preceding month is completed.

Birth, Death and Marriage Totals, for Principal Counties: February.

County.	February, 1913.		
	Births.	Deaths.	Marriages.
California	3,270	3,254	2,040
Counties of more than 25,000 population (1910):			
Alameda	313	294	198
Butte	49	21	18
Contra Costa	34	31	17
Fresno	127	84	57
Humboldt	31	26	11
Kern	46	42	28
Los Angeles	931	878	483
Marin	10	23	85
Orange	72	46	77
Riverside	38	37	37
Sacramento	108	108	81
San Bernardino	91	88	40
San Diego	98	111	88
San Francisco	595	564	424
San Joaquin	57	79	41
San Mateo	51	25	23
Santa Barbara	16	39	26
Santa Clara	86	133	63
Santa Cruz	34	32	10
Solano	29	30	7
Sonoma	41	59	25
Tulare	39	32	27
Selected groups:			
San Francisco and other bay counties	1,003	937	747
Los Angeles and Orange counties	1,003	924	560

Birth and Death Totals, for Principal Cities: February.

City.	February, 1913.	
	Births.	Deaths.
Freeholders' charter cities	2,081	2,024
Cities of more than 15,000 population (1910):		
Alameda	21	20
Berkeley	37	37
Fresno	51	39
Long Beach	33	48
Los Angeles	674	572
Oakland	213	188
Pasadena	48	46
Riverside	20	21
Sacramento	99	98
San Diego	79	80
San Francisco	595	564
San Jose	35	37
Stockton	16	38
Selected groups:		
San Francisco	595	564
Oakland, Alameda and Berkeley	271	245
Totals, bay cities	866	809
Los Angeles	674	572
Neighboring cities	95	124
Totals	769	696

Causes of Death.—The following table shows the classification of deaths in California for the current month, in comparison with the preceding month:

Deaths from Certain Principal Causes with Proportion per 1,000 Total Deaths for Current and Preceding Month, for California: February.

Cause of death.	Deaths:	Proportion per 1,000.	
		February.	January.
ALL CAUSES	3,254	1,000.0	1,000.0
Typhoid fever	23	7.1	5.8
Malarial fever	3	0.9	1.1
Smallpox	1	0.3	2.1
Measles	8	2.5	1.1
Scarlet fever	6	1.8	1.0
Whooping-cough	12	3.7	1.3
Diphtheria and croup	7	2.2	3.1
Influenza	43	13.2	14.6
Other epidemic diseases	21	6.5	3.1
Tuberculosis of lungs	411	126.3	108.4
Tuberculosis of other organs	67	20.6	18.3
Cancer	202	62.1	46.5
Other general diseases	126	38.7	45.5
Meningitis	50	15.4	8.1
Other diseases of nervous system	290	89.1	81.3
Diseases of circulatory system	556	170.9	194.7
Pneumonia and broncho-pneumonia	359	110.3	131.4
Other diseases of respiratory system	81	24.9	39.2
Diarrhea and enteritis, under 2 years	44	13.5	11.5
Diarrhea and enteritis, 2 years and over	18	5.5	6.0
Other diseases of digestive system	155	47.6	44.4
Bright's disease and nephritis	222	68.2	61.4
Childbirth	32	9.8	8.9
Diseases of early infancy	99	30.4	33.5
Suicide	66	20.3	19.3
Other violence	202	62.1	59.8
All other causes	150	46.1	48.6

In February there were 556 deaths, or 17.1 per cent of all, from diseases of the circulatory system, and 478, or 14.7 per cent, from various forms of tuberculosis. Heart disease thus led tuberculosis greatly, as for some months past.

Other notable causes of death were: Diseases of the respiratory system, 440; diseases of nervous system, 340; violence, 268; Bright's disease and nephritis, 222; diseases of digestive system, 217; cancer, 202; and epidemic diseases, 124.

The deaths from epidemic diseases were as follows: Influenza, 43; typhoid fever, 23; whooping cough, 12; measles, 8; diphtheria and croup, 7; scarlet fever, 6; and all other epidemic diseases, 25.

The deaths from the three leading epidemic diseases reported for the month were distributed by counties as follows:

Influenza.	
Alameda	2
Amador	1
Butte	1
Fresno	1
Imperial	1
Lake	1
Los Angeles	12
Monterey	2
Orange	4
Riverside	2
Sacramento	2
San Diego	1
San Francisco	3
San Mateo	1
Santa Clara	2
Sonoma	1
Stanislaus	3
Yolo	2
Yuba	1
Total	43

Typhoid fever.	
Alameda	3
Fresno	1
Kern	2
Los Angeles	3
Napa	1
Orange	1
Sacramento	2
San Bernardino	1
San Francisco	3
San Luis Obispo	1
Santa Clara	3
Tehama	1
Yolo	1
Total	23

Whooping-cough.	
Los Angeles	2
Napa	1
Orange	3
San Bernardino	2
San Francisco	1
Santa Barbara	1
Santa Clara	1
Stanislaus	1
Total	12

Geographic Divisions.—The following table presents data for geographic divisions, including the metropolitan area, or San Francisco and the other bay counties (Alameda, Contra Costa, Marin, and San Mateo), in comparison with the rural counties of Northern and Central California.

Deaths from Main Classes of Diseases from Geographic Divisions: February.

Geographic division.	Deaths: February.										
	All causes	Epidemic diseases	Tuberculosis (all forms)	Cancer	Diseases of nervous system	Diseases of circulatory system	Diseases of respiratory system	Diseases of digestive system	Bright's disease and nephritis	Violence	All other causes
THE STATE	3,254	124	478	202	340	556	440	217	222	268	407
Northern California	342	10	55	16	41	60	43	23	18	29	47
Coast counties	198	7	33	8	26	34	27	13	8	13	29
Interior counties	144	3	22	8	15	26	16	10	10	16	18
Central California	1,673	61	195	111	157	311	241	115	116	152	214
San Francisco	564	11	67	45	49	123	75	42	43	53	56
Other bay counties	373	11	39	28	36	72	57	18	27	40	45
Coast counties	211	11	25	10	26	42	30	14	13	9	31
Interior counties	525	28	64	28	46	74	79	41	33	50	82
Southern California	1,239	53	228	75	142	185	156	79	88	87	146
Los Angeles	878	32	160	59	99	144	111	57	65	61	90
Other counties	361	21	68	16	43	41	45	22	23	26	56
Northern and Central California	2,015	71	250	127	198	371	284	138	134	181	261
Metropolitan area	937	22	106	73	85	195	132	60	70	93	101
Rural counties	1,078	49	144	54	113	176	152	78	64	88	160

Sex and Age Periods.—The proportion of the sexes among the 3,254 decedents in February was: Male, 2,033, or 62.5 per cent; and female, 1,221, or 37.5 per cent.

The following table shows the age distribution by numbers and per cents, of deaths classified by sex:

Deaths Classified by Sex and Age Periods, with Per Cents by Age Periods, for California: February.

Age period.	Deaths.			Per cent.		
	Total.	Male.	Female.	Total.	Male.	Female.
ALL AGES	3,254	2,033	1,221	100.0	100.0	100.0
Under 1 year	318	179	139	9.8	8.8	11.4
1 to 4 years	105	61	44	3.2	3.0	3.6
5 to 14 years	84	48	36	2.6	2.3	2.9
15 to 24 years	214	124	90	6.6	6.1	7.4
25 to 34 years	313	193	120	9.6	9.5	9.8
35 to 44 years	345	224	121	10.6	11.0	9.9
45 to 54 years	411	266	145	12.6	13.1	11.9
55 to 64 years	443	290	153	13.6	14.3	12.5
65 years and over	1,021	648	373	31.4	31.9	30.6

This table shows that relatively more females than males died at the age periods under 35 years as well as at 65 years and over, while relatively more males than females died at the age periods from 35 to 64 years.

Occupations.—The table below gives, for deaths 15 years and over, the number of men and women for whom such occupation was reported in contrast with those for whom no gainful occupation was shown.

Deaths, Fifteen Years and Over, Classified by Sex and Occupation, with Per Cents by Sex, for California: February.

	Deaths.			Per cent male.	Per cent female.
	Total.	Male.	Female.		
15 YEARS AND OVER	2,747	1,745	1,002	63.5	36.5
Occupation reported	1,555	1,459	96	93.8	6.2
No gainful occupation	1,192	286	906	24.0	76.0

Of the 1,555 decedents for whom occupations were reported the males numbered 1,459, or 93.8 per cent, and the females only 96, or 6.2 per cent.

The following table shows the distribution of male decedents 15 years and over, engaged in the main kinds of occupation.

Deaths of Males Fifteen Years and Over Engaged in Gainful Occupations, Classified by Kind of Occupation, with Per Cents, for California: February.

Kind of occupation.	Males 15 years and over.	
	Deaths.	Per cent.
ALL OCCUPATIONS	1,459	100.0
Professional	87	6.0
Clerical and official	107	7.3
Mercantile and trading	120	8.2
Public entertainment	42	2.9
Personal service, police and military	54	.3.7
Laboring and servant	296	20.3
Manufacturing and mechanical industry	297	20.4
Agriculture, transportation and other outdoor pursuits	448	30.7
All other occupations	8	0.5

Of the 1,459 male decedents for whom occupations were reported, 448, or 30.7 per cent, were engaged in agriculture, transportation, and other outdoor pursuits; 297, or 20.4 per cent, in manufacturing and mechanical industry; 296, or 20.3 per cent, in laboring and servant work; and altogether 418, or 28.6 per cent, in professional, clerical and official, mercantile and trading, and all other occupations.

It should be noted that the figures on deaths occurring in different occupations are necessarily affected by the fact that in California a large number of men are engaged in agriculture and other outdoor pursuits, while relatively few follow professional and similar occupations, which show small numbers of deaths.

REPORT OF THE BUREAU OF THE HYGIENIC LABORATORY FOR MARCH.

WILBUR A. SAWYER, M.D., Director.

The laboratory is proving of service to an ever increasing number of the communities of our State. During the month of March, 260 specimens were examined for 118 physicians and veterinarians in 80 cities and towns situated in 33 counties. There are still many communities which have not yet learned to improve their health conditions by taking advantage of the laboratory tests furnished by the State. The counties from which specimens were sent in March are the following: Alameda, Amador, Butte, Colusa, Contra Costa, Fresno, Humboldt, Kern, Kings, Los Angeles, Madera, Marin, Mendocino, Merced, Napa, Nevada, Orange, Placer, Riverside, Sacramento, San Bernardino, San Francisco, San Joaquin, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, Shasta, Siskiyou, Solano, Stanislaus, Tulare, Yuba.

Division of Biological Examinations.

Summary of Examinations made in the California State Hygienic Laboratory during the month of March, 1913.

Condition suspected.	Positive.	Negative.	Inconclusive.	Total.
Main Laboratory at Berkeley:				
Anthrax		2		2
Diphtheria	38	31	1	70
Gonococcus infection	6	14		20
Hookworm		1		1
Malaria		1		1
Rabies	33	2	1	36
Tuberculosis	6	14		20
Typhoid	4	14		18
Water pollution	3	8		11
Miscellaneous	1	4		5
				184
Northern Branch at Sacramento:				
Diphtheria	6	12	2	20
Malaria	1	3		4
Tuberculosis		6		6
Typhoid		2		2
				32
San Joaquin Valley Branch at Fresno:				
Diphtheria	3	11		14
Tuberculosis	2	1		3
				17
Southern Branch at Los Angeles:				
Diphtheria	9	11	3	23
Rabies	1			1
Tuberculosis	1			1
Typhoid		1	1	2
				27
Total number of examinations				260

Division of Preventive Therapeutics.

Pasteur Treatment for the Prevention of Rabies by the State Hygienic Laboratory during the month of March, 1913.

	Treatment commenced.	Treatment completed.
Main Laboratory at Berkeley	7	14
Northern Branch at Sacramento	2	1
San Joaquin Valley Branch at Fresno	4	3
Southern Branch at Los Angeles	0	0
Laboratory of Sacramento Board of Health, by deputized bacteriologist	0	0
Laboratory of San Francisco Board of Health, by deputized bacteriologist	15	11
Laboratory of Los Angeles Board of Health, by deputized bacteriologist	2	2
Laboratory of Letterman General Hospital, Presidio, by deputized bacteriologist	2	1
	32	32

Public Health Instruction.

Participation in Instruction in Public Health during March, 1913.

Main Laboratory at Berkeley:

Bacteriological instruction outfits sent out	2
Bacteriological instruction outfits in use	21
Lectures or talks by the Director	0

Division of Epidemiological Investigations.

Epidemiological Investigations during March, 1913.

Main Laboratory at Berkeley:

- Special investigations by the Director — 7
  - Bacteriological examination of cement and coal dusts.
  - Investigation of a slaughter-house and fertilizer plant in Oakland.
  - Investigation of the need for prolonged quarantine in a case of questioned scarlet fever in Berkeley.
  - Investigation of a case of suspected poliomyelitis in Alameda.
  - Investigation of scarlet fever in the State Deaf, Dumb and Blind Institute in Berkeley.
  - Investigation of smallpox in the State Hospital at Stockton.
  - Continuation of the investigation into the methods of spread of poliomyelitis.
- Special investigation by the Chief Bacteriologist — 1
  - Investigation of the methods of sterilization in common use in barber shops.
- Special investigation by the Assistant Bacteriologist — 1
  - Continuation of the study of the virulence of diphtheria bacilli isolated from the throats of carriers.

Explanatory Note.—The use of negative cultures in releasing patients from quarantine, and in dealing with diphtheria-carriers, presents many difficulties when applied as a routine administrative measure. The following report bears upon one of a series of carrier problems, upon which the Director of the Laboratory has been instructed to collect experimental data, to be used as a basis for new administrative procedures.

Revised List of Depositories for the Mailing Outfits of the State Hygenic Laboratories.

County.	Town.	Drug store.
Alameda	Haywards	Rogers' Pharmacy
	Livermore	McKown & Mess
	Niles	Sneden's Pharmacy
	Oakland	Philip & Philip
	Pleasanton	Peter Rock
	San Leandro	O. J. Lynch's Pharmacy
Amador	Ione	Model Drug Store
	Sutter Creek	Morris & Siebe
Butte	Chico	Ben Hastings Pharmacy
	Gridley	The Gridley Pharmacy
Colusa	Arbuckle	Chas. G. Stinson
	Colusa	Oscar Robinson
	Maxwell	Fouch's Drug Store
	Williams	J. F. Fouch
Contra Costa	Antioch	Palace Drug Co.
	Concord	C. W. Klein
	Crockett	Crockett Drug Co.
	Pinole	Pinole Drug Co.
	Richmond	Ferguson's Drug Store
Del Norte	Crescent City	Bowman's Drug Store
Fresno	Clovis	Clovis Drug Store
	Fresno	San Joaquin Drug Co.
	Kingsburg	Reliable Pharmacy
	Reedley	Reedley Drug Co.
	Sanger	O. A. Brehler
	Selma	Dusy & Sawrie
Glenn	Orland	Birch & Co.
Humboldt	Arcata	Skinner Duprey Drug Co.
	Eureka	Keller-Bohmansson Drug Co.
	Fortuna	Bowman's Drug Store
Imperial	Brawley	Fulton's Pharmacy
	Calexico	Aitken's Pharmacy
	Holtville	Holtville Pharmacy
Kern	Delano	Ramsay's Pharmacy
	East Bakersfield	Kern Drug Co.
	McKittrick	McKittrick Pharmacy
	Taft	Taft Pharmacy
	Tehachapi	Yerian Brothers
Kings	Corcoran	Corcoran Drug Store
Lake	Kelseyville	Pond Drug Store
	Lakeport	Meddaugh's Drug Store
	Lower Lake	Dr. H. P. Weiper
	Middletown	Middletown Drug Store
Lassen	Susanville	J. B. Spaulding

County.	Town.	Drug store.
Los Angeles	Alhambra	F. B. Elwood
	Artesia	Artesia Pharmacy
	Azusa	Dolly Drug Co.
	Burbank	Burbank Pharmacy
	Claremont	College Drug Store
	Compton	Delmar Pharmacy
	Covina	W. W. Nash
	Downey	The Haygood Pharmacy
	Eagle Rock	Eagle Rock Drug Co.
	El Monte	El Monte Drug Store
	Florence	Florence Pharmacy
	Glendale	Glendale Pharmacy
	Huntington Park	Batcheller's Pharmacy
	Inglewood	Sollenberger's Drug Store
	Lordsburg	Kenyon's Pharmacy
	Los Angeles	M. S. Tague
	Monrovia	Thos. Neville
	Ocean Park	Moody's Drug Store
	Tropico	Chas. F. Story's Pharmacy
	Venice	People's Drug Co.
Marin	Belvedere	Belvedere Pharmacy
	Mill Valley	Lockwood Pharmacy
	San Anselmo	Poppy Pharmacy
	San Rafael	Day's Pharmacy
	Sausalito	Sausalito Drug Co.
Mendocino	Fort Bragg	Pacific Drug Store
	Mendocino	C. O. Packard Drug Store
	Ukiah	Gibson's Pharmacy
	Willits	Rex Drug Co.
Merced	Dos Palos	Dos Palos Drug Store
	Los Banos	Bertholf Drug Store
	Merced	Merced Drug Co.
Modoc	Alturas	Gibson Drug Co.
Monterey	Monterey	Palace Drug Co.
	Salinas	Krough's Drug Store
Napa	Napa	Brownlee's Drug Store
Nevada	Nevada City	Dickerman Pharmacy
Orange	Anaheim	Mullinix Drug Store
	Orange	K. E. Watson Co.
	Fullerton	Finch's Drug Store
	Santa Ana	Rowley Drug Co.
Placer	Auburn	J. G. McLaughlin
	Colfax	J. L. Butler & Son
	Dutch Flat	Dr. J. H. Johnston
	Lincoln	Ingram's Drug Store
	Loomis	Loomis Pharmacy
Plumas	Quincy	Quincy Drug Store
Riverside	Banning	Banning Drug Store
	Beaumont	Robert Fulton
	Hemet	Wedemeyer's Pharmacy
	Riverside	F. A. Gardner & Co.
Sacramento	Elk Grove	"Ye Medicine Shop"
	Folsom	S. H. & F. P. Burnham
San Bernardino	Chino	Reher's Pharmacy
	Colton	Colton Pharmacy
	Redlands	Mont. P. Chubb Drug Co.
	San Bernardino	Owl Drug Store

County.	Town.	Drug store.
San Diego	Chula Vista	Wigginton's Pharmacy
	Escondido	Baldbridge Drug Co.
	La Mesa	La Mesa Drug Store
	Oceanside	Exton & Nichols
	Ramona	Thos. Jerman
	San Diego	Ferris & Ferris
San Joaquin	Stockton	Eagle Drug Store
San Luis Obispo	Arroyo Grande	W. A. Conrad, Jr.
	Cambria	People's Drug Store
	Paso Robles	W. C. Bennett
	San Luis Obispo	People's Pharmacy
Santa Clara	Campbell	Orchard City Drug Co.
	Los Gatos	Geo. A. Green's Pharmacy
	Mountain View	E. T. Johnson
	San Jose	Curtis & Henkle Drug Co.
	Santa Clara	Madden's Pharmacy
Santa Cruz	Santa Cruz	Palmer Drug Co.
	Watsonville	Steinhauser & Eaton
Shasta	Redding	Powell Pharmacy Co.
Sierra	Downieville	Downieville Drug Store
	Loyalton	Loyalton Drug Co.
Siskiyou	Dunsmuir	Red Cross Drug Store
	Etna Mills	W. J. Balfrey
	Sisson	Mt. Shasta Pharmacy
	Yreka	Avey Drug Co.
Solano	Benicia	Benicia Pharmacy
	Dixon	California Drug Store
	Rio Vista	Rio Vista Pharmacy
	Suisun	Criterion Drug Store
	Vacaville	Reid Drug Co.
	Vallejo	Vallejo Drug Co.
Sonoma	Healdsburg	Rathke Pharmacy
	Petaluma	Young-Herold Drug Co.
	Santa Rosa	Hahman Drug Co.
Stanislaus	Ceres	Ceres Drug Co.
	Modesto	Maze Drug Store
	Newman	Pioneer Drug Store
	Oakdale	Endicott's Drug Store
	Turlock	Turlock Drug Co.
Tehama	Red Bluff	Elmore Pharmacy
Trinity	Weaverville	D. B. Fields, M.D.
Tulare	Dinuba	McCracken's Pharmacy
	Exeter	Mixter Pharmacy
	Lindsay	Lindsay Drug Co.
	Tulare	E. Allen Test
	Visalia	J. M. Boynton
Tuolumne	Sonora	Union Drug Store
	Tuolumne	Bigelow's Drug Store
Ventura	Nordhoff	Ojai Drug Store
	Santa Paula	Cauch's Drug Store
	Ventura	Pioneer Drug Store
Yolo	Winters	Day's Drug Store
	Woodland	John V. Leithold
Yuba	Marysville	Horning Drug Co.
	Wheatland	Wheatland Pharmacy

A SPECIAL INVESTIGATION INTO THE VIRULENCE OF DIPHTHERIA BACILLI IN THE THROATS OF CARRIERS.

By Esther M. Skolfield, A.B., Assistant Bacteriologist,
State Hygienic Laboratory.

Recently, because of the question of quarantine, the State Hygienic Laboratory found it of interest to investigate the virulence of diphtheria bacilli in the throats of recovered patients who had retained the organisms from six weeks to three and one half months. The patients were residents of Berkeley, Alameda, and Hayward.

Technique.

The guinea-pig inoculation test was used. The technique requires special consideration.

(*a*) Types of bacilli. Recorded according to Wesbrook's classification. The types are given in order of predominance.

(*b*) Animal inoculation test.

1. Isolation either by fishing distinct colonies from the throat culture, or by means of the "streak method." The colonies were first planted upon Loeffler's blood serum medium.
2. Examination of colonies and inoculation of a tube containing 8 to 10 c.c. of alkaline broth.
3. Broth cultures slanted and grown for forty-eight hours at 37° C. If growth was not heavy on first transplant into broth, a second transplant was made and grown forty-eight hours.
4. Examination of broth cultures for purity of growth. All the strains of bacilli from the same patient were mixed. A normal guinea-pig weighing between 250 and 350 grams, preferably 250 grams, was injected near the median line of the abdomen with a dose corresponding to 0.5 per cent of the body weight of guinea-pig, expressed in cubic centimeters. A control guinea-pig was given a corresponding amount of culture and an equal amount of antitoxin containing 600 units per c.c.
5. The animals were kept under careful observation for four days, and were examined for edema at point of inoculation. Death within four days with typical lesions was considered a positive test.
6. In case of death, autopsy was performed and smears were made from the pus at the point of inoculation.

The preparation of the broth is especially important. Beef infusion broth, neutralized to litmus with Na_2CO_3 and then made 0.7 per cent alkaline with normal KOH or NaOH, seems to produce the maximum amount of toxin in the shortest time. The formula used is a slight modification of that of Dean, described in *The Journal of Hygiene* for December, 1912.[1] The addition of dextrose, as recommended by Kolmer,[2] is unnecessary. That beef infusion broth is better than beef extract broth is shown by the striking superiority of the former in abundance and rapidity of growth, and, as illustrated in the L. case, in the virulence of the culture.

Formula for beef infusion broth. (Based on methods of Hiss and Zinsser,[3] and Dean.)

1. Infuse 500 grams of ground lean beef, twelve to twenty-four hours, with 1,000 c.c. of distilled water, in refrigerator.
2. Strain through wet cheese cloth and make up volume to 1,000 c.c.

3. Add 5 grams of common salt and 15 grams of Witte's peptone.
4. Warm over water bath until peptone is dissolved, not allowing temperature to rise above 50° C.
5. Make up for loss of volume by evaporation.
6. Neutralize with Na_2CO_3 solution, using litmus paper as indicator, and then add 7 c.c. normal KOH or NaOH solution.
7. Heat in Arnold sterilizer for 30 minutes; shake, and heat again for 15 minutes.
8. When cold, filter through cotton until clear. Tube, and autoclave for 20 minutes.

Experiments.

Patient's name and residence.	Time since taking of first culture.	Type of bacillus in culture used.	Broth, reaction, and transplant.	Weight of guinea-pig in grams.	Time required for death of guinea-pig.
C. D., Hayward	44 days	DD_1 3 strains used.	Beef extract —0.7 2d transplant	250	95½ hours
	60 days	D_2D_1D 2 strains used.	Beef infusion —0.7 2d transplant	292	30-36 hours
	88 days	D_2D_1 3 strains used.	Beef infusion —0.7 2d transplant	348	29 hours
K. R., Hayward	43 days	D_1D_2E 1 strain used.	Beef extract —0.7 3d transplant	280	42 hours
M. R., Hayward	40 days	DD_2 1 strain used.	Beef extract —0.7 2d transplant	240	44 hours
	85 days	EDD_2C 4 strains used.	Beef infusion —0.7 2d transplant	230	25-39 hours
O. G., Hayward	46 days	$CBDD_2E$ 1 strain used.	Beef infusion —0.7 2d transplant	293	24 hours
S., Alameda	92 days	DC 2 strains used.	Beef infusion —0.7 1st transplant	355	42 hours
B., Alameda	90+ days	DD_2 1 strain used.	Beef infusion —0.7 1st transplant	365	36 hours
Berkeley case (used as control)	1st culture	CD 1 strain used.	Beef extract —0.7 2d transplant	270	60 hours
*L., Berkeley	47 days	D_2D	Beef extract —0.7 3d transplant	250	36 hours
L., Berkeley	60 days	D_2 (a few of Type D.)	Beef extract +0.	250	no death
Test 1		3 strains used.	1st transplant, poor growth		
Test 2		Same as in test 1.	Beef extract —0.7 11 days' growth	260	14 days no lesions
Test 3		D_2D 2 strains used.	Beef extract —0.7 3d transplant, growth good	250	12 days no lesions
Test 4		Same as in test 3.	Beef infusion —0.7 1st transplant	360	48 hours
	105 days	CD 2 strains used.	Beef infusion —0.7 2d transplant	292	84-90 hours

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*This test was made in the Department of Hygiene of the University of California by Miss Jewel Fay, who has kindly given me her results.

The control guinea-pigs were protected by antitoxin in every case.

Lesions.—Upon autopsy, the point of inoculation was found soggy with bloody exudate and a small amount of pus, which on smears showed diphtheria bacilli, many of which were inside of leucocytes. The body wall was usually redder than normal. Hemorrhages were noted under the peritoneum of the abdominal wall, of the mesentery, and of the stomach, and also superficially in the heart. The body exudates were often increased. Circumscribed areas of pus occurred within the abdominal cavity near the inguinal glands, and, in one case, around the pancreas. Most typical was a congestion of the internal organs, particularly the adrenal glands, which appeared swollen and dark red, instead of yellow, in color.

Discussion.

The L. case presents some interesting results. The virulence of similar types of bacilli, isolated at different times, seems to vary as shown by Miss Fay's experiment and my third test. Also, since the virulence was probably slight, the broth used made a difference in results because of the quantity of toxin produced. This was shown by my third and fourth tests, where the only apparent cause for the fourth test being positive was the use of beef infusion instead of beef extract broth. Clinically, this case is interesting in that the patient had only mild symptoms of tonsilitis though typical diphtheria bacilli were demonstrated in the throat. Granular types of the diphtheria bacillus were retained in the throat for over four months.

Although all the carriers mentioned in this experiment were released from quarantine and permitted to attend school before negative cultures were obtained, up to the present time (two to three months after release) we have learned of no contact cases from these patients. The relative virulence of diphtheria bacilli to the sensitive guinea-pig and to more or less resistant human beings has been discussed too often, without experimental data, to give space to it here. However, it is generally conceded that the guinea-pig tests may be of aid in the practical management of diphtheria.

Conclusions.

In testing the virulence of diphtheria bacilli, beef infusion broth, first made neutral to litmus with Na_2CO_3 or $MgCO_3$, and then made 0.7 per cent alkaline with normal KOH or NaOH, gives excellent results. Several strains of *B. diphtheriæ* should be isolated and a good growth on broth obtained before the inoculation of the guinea-pig.

If guinea-pig tests are used, I recommend that they be used merely on cultures from "release" patients continuing to show only solid types of diphtheria bacilli, and, in rare cases, where a patient whose cultures show granular types is held in quarantine over a long period of time. It is of value in dealing with plain bacilli to differentiate between *B. Hoffmanni* and solid types of *B. diphtheriæ* by sugar broths. However, I do not consider that the virulence tests performed in this investigation have been of sufficient value in the management of the cases to warrant the use of the test in routine work.

References.

[1]MacConkey, A. (1912). The Toxin of B. diphtheriæ. Jour. of Hygiene, XII 508.

[2]Kolmer, John A. (1912). Bacteriology of Diphtheria. Jour. of Infectious Diseases, XI 65.

[3]Hiss, P. H., and Zinsser, Hans (1910). Text-book of Bacteriology, 124.

REPORT OF BUREAU OF FOODS AND DRUGS FOR MARCH, 1913.

M. E. JAFFA, Director.

It is encouraging to note from the reports of the inspectors when visiting small towns that the dealers are co-operating with the State Board of Health in the enforcement of the pure food and drug laws. This is evidenced by the desire on the part of the retailer to procure a proper guarantee from the wholesaler, and it is more than gratifying to know that the wholesaler or jobber is invariably willing to accede to the request of the retailer in this connection. From the correspondence and reports, it is also evident that the wholesaler, jobber or importer is always willing to exchange old and mislabeled samples for those conforming to the law.

During the month of February, 1913, upwards of one hundred sample of various foods, food products and drugs were received at the laboratory, the majority of samples being submitted by the official inspectors, but quite a number were forwarded by the stewards of the different state institutions for examination and analysis in order to ascertain whether or not the materials supplied to said institutions were in conformity with the specifications for the prospective products.

The list of foods examined would indicate that there is no special mention to be made with reference to any one article of food.

Of the samples sent in, meats, extracts and vinegars predominate. It may be said that a very few of the samples of meats submitted were found to be in violation of the law.

The retail butchers in the State are complying with the rules and regulations of the State Board of Health in the matter of the use of preservatives and the proper labeling of meat and meat food products. Advice or suggestion concerning the correct labeling will be cheerfully given upon application to Director of Bureau of Foods and Drugs, Berkeley, Cal. No food inspection decisions were received during the past month.

Any one wishing copies of judgments as listed below may obtain the same by addressing the Director of Food and Drug Laboratory, University of California, Berkeley, Cal.

The following Notices of Judgments have reached the laboratory and are available for distribution to those interested:

No. 1893—Adulteration and Misbranding of Oats.
No. 1895—Alleged Adulteration and Misbranding of Grape Juice.
No. 1897—Alleged Misbranding of Jelly.
No. 1901—Misbranding of Horse Feed.
No. 1903—Misbranding of Canned Sugar Corn.
No. 1900—Misbranding of Hominy Feed.
No. 1902—Adulteration and Misbranding of Cordial.
No. 1904—Adulteration and Misbranding of Cove Oysters.
No. 1905—Adulteration and Misbranding of Vinegar.
No. 1906—Adulteration and Misbranding of Strawberry Flavor, Pear Flavor, and Pineapple Flavor.
No. 1907—Adulteration and Misbranding of Mixed Feed.
No. 1908—Misbranding of So-called Digesto Malt Extract.
No. 1909—Adulteration and Misbranding of Ferro China Bisleri and of Fernet Branca.
No. 1910—Adulteration of Tomatoes.
No. 1920—Adulteration and Misbranding of Tomato Catsup.
No. 1911—Adulteration and Misbranding of So-called Temperance Tonic.

No. 1912—Misbranding and Alleged Adulteration of Cough, Cold, Throat and Lung Cure.

No. 1913—Adulteration and Misbranding of Wine.

No. 1914—Misbranding of Pears.

No. 1915—Adulteration and Misbranding of Vinegar.

No. 1916—Misbranding of Tea.

Nos. 1917, 1918—Misbranding of Cheese.

No. 1919—Adulteration of Maple Syrup.

No. 1921—Adulteration and Misbranding of So-called Wild Cherry Cordial.

Nos. 1922, 1923—Adulteration and Misbranding of So-called Atlas Carbonated Soda.

No. 1924—Adulteration and Misbranding of Syrup of Tamarind.

No. 1925—Adulteration of Butter.

Nos. 1926, 1927—Adulteration of Confectionery.

No. 1928—Adulteration and Misbranding of Jamaica Ginger Essence and of Wintergreen Essence.

Nos. 1929, 1932—Adulteration of Milk.

No. 1930—Adulteration of Cream.

No. 1931—Misbranding of So-called Champagne.

No. 1933—Misbranding and Alleged Adulteration of So-called Terpeneless Lemon Oil.

No. 1934—Misbranding of Grits.

Nos. 1935, 1936, 1954, to 1985 incl., 1988 to 2045 incl., 2051, 2068, 2092, 2151 to 2154 incl.—Adulteration of Milk.

No. 1937—Misbranding of Whiskey.

No. 1938—Misbranding of Raisins.

No. 1939—Misbranding of Chewing Gum.

No. 1940—Misbranding of Vanillin Powder.

Nos. 1941, 1953—Adulteration and Misbranding of So-called Cider Vinegar.

Nos. 1942, 1987—Adulteration of Tomato Catsup.

Nos. 1943, 2085—Misbranding of Syrup.

Nos. 1944, 1948, 2083, 2693—Adulteration and Misbranding of Vinegar.

No. 1945—Adulteration and Misbranding of So-called Wurtzburger Malt Tonic.

No. 1946—Misbranding of Butter.

No. 1947—Misbranding of Apple Strawberry Jelly and Apple Raspberry Jelly.

No. 1949—Alleged Misbranding of Oil.

No. 1950—Adulteration of Mineral Water.

Nos. 1951, 2077—Adulteration of Stock Feed.

No. 1952—Adulteration and Misbranding of Cider.

Nos. 1986, 2142—Alleged Adulteration and Misbranding of Evaporated Milk.

Nos. 2046, 2048, 2081, 2101, 2102—Adulteration and Misbranding of So-called Olive Oil.

No. 2047—Misbranding of Lemon Flavor.

No. 2049—Adulteration of Catsup.

No. 2050—Misbranding of Canned Peas.

No. 2052—Adulteration and Misbranding of So-called Syrup of Tamarind.

No. 2053—Misbranding of "Sunshine Suffolk Biscuit (Arrowroot)."

No. 2054—Adulteration and Misbranding of So-called Grape Juice.

No. 2055—Misbranding of Confectionery.

No. 2056—Adulteration and Misbranding of So-called Blackberry Flavored Juice.

No. 2057—Adulteration of Cheese.

No. 2058—Adulteration of Chicory.

No. 2059—Adulteration and Misbranding of Nitroglycerin Tablets.

Nos. 2060, 2137—Adulteration and Misbranding of Blackberry Cordial.

No. 2061—Adulteration and Misbranding of So-called Concentrated Export Vinegar.

No. 2062—Adulteration and Misbranding of So-called Gelatine.

No. 2063—Misbranding of Fish.

No. 2064—Misbranding of Cream and Evaporated Milk.

No. 2065—Misbranding of So-called Lemon Extract and Orange Extract, and Adulteration and Misbranding of So-called Vanilla Extract.

No. 2066—Adulteration and Misbranding of So-called Blended Peach Brandy.

No. 2067—Adulteration and Misbranding of Tomatoes.

No. 2069—Misbranding of Mincemeat.

No. 2070—Misbranding of "Lukum."

No. 2071—Misbranding of So-called Fruit Juice.

No. 2072—Adulteration of Oil of Cassia.

No. 2073—Adulteration and Misbranding of Beer.

No. 2074—Adulteration and Misbranding of Peas.

No. 2075—Misbranding of Fernet-L-Branca.

No. 2076—Misbranding of Lukoumia (Candy).

No. 2078—Misbranding of Pepper.

No. 2079—Adulteration of Herring.

No. 2080—Misbranding of Sorghum Syrup.

No. 2082—Adulteration and Misbranding of Jelly.

Cases Ordered Referred to District Attorneys March 1, 1913.

Article.	Offense.	Manufacturer or jobber.	Accused dealer.	Locality.
Fresh eggs	Mislabeled. Eggs were not fresh	Loeb, Fleishman & Co.	(Protected by guaranty)	Los Angeles.
Chopped meat	Adulterated. Contains sulphites, over 500 mg. per kilo.		Saratoga Market	San Jose.
Fresh eggs	Mislabeled. Eggs were not fresh		A. Zenorini	Los Angeles.
Test eggs	Mislabeled and adulterated. Sample consisted wholly or in part of decomposed and putrid eggs.		S. D. Needham	Berkeley.
Fresh eggs	Mislabeled. Eggs were not fresh	Loeb, Fleishman & Co.	(Protected by guaranty)	Los Angeles.

REPORT OF BUREAU OF PUBLICATIONS AND HEALTH INFORMATION FOR MARCH, 1913.

GUY P. JONES, Acting Director.

There are very few cities in the State where some sort of "clean-up" campaign has not been conducted this spring. From Siskiyou to San Diego reports have come pouring into this office of successful fights in fly extermination and all manner and sort of refuse removal. Several cities have devoted their civic energy to the eradication of mosquitoes and at least three of the municipalities have started active work in improving their housing conditions. Several thousand newspaper clippings filed in this office tell the story of the multitude of activities along these lines that have been undertaken by the people.

This Bureau has a limited number of bulletins containing suggestions for conducting a "clean-up" campaign which will be sent free of all cost to any one who requests that it be sent to him.

LIST OF COUNTY HEALTH OFFICERS.

County.	Health officer.	Address.
Alameda	Dr. C. L. McKown	Niles
Alpine*	County Recorder Frank Smith	Markleeville
Amador	Dr. E. E. Endicott	Jackson
Butte	Dr. L. Q. Thompson	Gridley
Calaveras	Dr. Irwin B. March	San Andreas
Colusa	Dr. C. A. Poage	Colusa
Contra Costa	Dr. W. S. George	Antioch
Del Norte	Dr. E. M. Fine	Crescent City
El Dorado	Dr. L. M. Leisenring	Placerville
Fresno	Dr. G. L. Long	Fresno
Glenn	Dr. J. A. Randolph	Willows
Humboldt	Dr. Carl T. Wallace	Eureka
Imperial	Dr. Virgil McCoombs	El Centro
Inyo	Dr. I. J. Woodin	Independence
Kern	Dr. G. M. Bumgarner	Bakersfield
Kings	Dr. Ralph Motherol	Hanford
Lake	Dr. W. E. Upton	Kelseyville
Lassen	Dr. R. W. T. Garner	Susanville
Los Angeles	Dr. E. O. Sawyer	Los Angeles
Madera	Dr. Mary R. Butin	Madera
Marin	Dr. J. H. Kuser	Novato
Mariposa	Dr. F. W. Gallion	Mariposa
Mendocino	Dr. J. Liftchild	Ukiah
Mercod	Dr. J. H. Mudd	Merced
Modoc	Dr. John Stile	Alturas
Mono*	Dr. R. A. Cushman	Bridgeport
Monterey	Dr. Garth Parker	Salinas
Napa	Dr. E. G. Smart	Napa
Nevada	Dr. Carl P. Jones	Grass Valley
Orange	Dr. John Wehrly	Santa Ana
Placer	Dr. J. S. Wheeler	Roseville
Plumas	Dr. F. D. Walsh	Quincy
Riverside	Dr. George E. Tucker	Riverside
Sacramento	Dr. Hugh Beattie	Elk Grove
San Benito	Dr. J. M. O'Donnell	Hollister
San Bernardino	Dr. Philip M. Savage	San Bernardino
San Diego	Dr. O. G. Wicherski	San Diego
San Francisco	Dr. R. G. Brodrick	San Francisco
San Joaquin	Dr. H. C. Peterson	Stockton
San Luis Obispo	Dr. H. M. Cox	San Luis Obispo
San Mateo	Dr. W. G. Beattie	Colma
Santa Barbara	Dr. J. C. Bainbridge	Santa Barbara
Santa Clara	Dr. William Simpson	San Jose
Santa Cruz	Dr. W. H. Keck	Santa Cruz
Shasta	Dr. F. Stabel	Redding
Sierra	Dr. R. B. Davy	Downieville
Siskiyou	Dr. F. J. McNulty	Yreka
Solano	Dr. S. G. Bransford	Suisun
Sonoma	Dr. P. A. Meneray	Santa Rosa
Stanislaus	Dr. J. L. Hennemouth	Modesto
Sutter	Dr. E. V. Jacobs	Meridian
Tehama	Dr. W. F. Maggard	Corning
Trinity	Dr. D. B. Fields	Weaverville
Tulare	Dr. W. A. Preston	Visalia
Tuolumne	Dr. Wm. Lyman Hood	Sonora
Ventura	Dr. A. A. Maulhardt	Oxnard
Yolo	Dr. W. J. Blevins	Woodland
Yuba	Dr. J. H. Barr	Marysville